AMENDMENT TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claim 1 (Currently amended): A frequency synchronizer system, comprising:

~~a processor for executing a sequence of operations, where said operations include:~~

~~a) initializing an estimated frequency correction factor;~~

~~b)~~ means for determining a corrected frequency offset value from a first product of a sample signal and ~~said~~ an estimated frequency correction factor;

~~c)~~ means for filtering a first sample of said corrected frequency offset value to obtain a filtered corrected frequency offset value;

~~d)~~ means for imparting a delay to a second sample of said corrected frequency offset value to obtain a delayed corrected frequency offset value;

~~e)~~ means for ~~determining~~ transforming into a conjugate product value ~~from a second product of said filtered corrected frequency offset value and a conjugate of~~ said filtered corrected frequency offset value;

~~f)~~ means for determining a delay conjugate value from a third product of said delayed corrected frequency offset value and said conjugate product value;

~~g)~~ means for determining an error signal from said delay conjugate value;

~~h)~~ means for determining a frequency offset value from said error signal; and

~~i)~~ means for determining an updated value of said estimated frequency correction factor from said frequency offset value.

Claim 2 (Canceled)

Claim 3 (Currently amended): The frequency synchronizer system of claim 1 further ~~including~~ comprising a digital receiver for providing an estimate of data encoded in a continuous-phase modulation signal in response to receiving said corrected frequency offset value.

Claim 4 (Currently amended): The frequency synchronizer system of claim 1 further ~~including~~ comprising an anti-aliasing filter for transforming said continuous-phase modulation signal into a filtered signal.

Claim 5 (Currently amended): The frequency synchronizer system of claim 4 further ~~including~~ comprising a sampler for transforming said filtered signal into a sequence of discrete time based samples.

Claim 6 (New): A frequency synchronizer system, comprising:

a sample signal, $x(kT_s)$, where k is the sample index and T_s defines the sampling interval in seconds;

means for determining a corrected frequency offset value, $y(kT_s)$, from a first product of said sample signal and an estimated frequency correction factor, wherein said estimated frequency correction factor is a discrete time sequence defined by $e^{-j2\pi k\hat{V}T_s}$ and where $\hat{V}$ is an estimate of unknown frequency offset V;

means for filtering a first sample of said corrected frequency offset value, $y(kT_s)$, to obtain a filtered corrected frequency offset value, $w(kT_s)$;

means for imparting a delay D to a second sample of said corrected frequency offset value, $y(kT_s)$, to obtain a delayed corrected frequency offset value, $y[(k-D)T_s]$;

means for transforming into a conjugate product value, $w^*(kT_s)\,w(kT_s)$ said filtered corrected frequency offset value, $w(kT_s)$;

means for determining a delay conjugate value from a third product of said delayed corrected frequency offset value , $y[(k-D)T_s]$, and said conjugate product value, $w^*(kT_s)\,w(kT_s)$;

means for determining an error signal, *e(nT)*, where *n* is a positive integer index allowing for the generation of updated error signals at intervals of *T* seconds, from said delay conjugate value, $y[(k-D)T_s]$;

means for determining a frequency offset value, $\hat{v}(nT)$, from said error signal, *e(nT)*; and

means for determining an updated value of said estimated frequency correction factor from said frequency offset value, $\hat{v}(nT)$.

Claim 7 (New): The frequency synchronizer system of claim 6 further comprising a digital receiver for providing an estimate of data encoded in a continuous-phase modulation signal in response to receiving said corrected frequency offset value.

Claim 8 (New): The frequency synchronizer system of claim 6 further comprising an anti-aliasing filter for transforming said continuous-phase modulation signal into a filtered signal.

Claim 9 (New): The frequency synchronizer system of claim 8 further comprising a sampler for transforming said filtered signal into a sequence of discrete time based samples.

Claim 10 (New): A method for frequency synchronization, comprising the steps of:

(a) initializing an estimated frequency correction factor;

(b) determining a corrected frequency offset value from a first product of a sample signal and said estimated frequency correction factor;

(c) filtering a first sample of said corrected frequency offset value to obtain a filtered corrected frequency offset value;

(d) imparting a delay to a second sample of said corrected frequency offset value to obtain a delayed corrected frequency offset value;

(e) determining a conjugate product value from a second product of said filtered corrected frequency offset value and a conjugate of said filtered corrected frequency offset value;

(f) determining a delay conjugate value from a third product of said delayed corrected frequency offset value and said conjugate product value;

(g) determining an error signal from said delay conjugate value;

(h) determining a frequency offset value from said error signal; and

(i) determining an updated value of said estimated frequency correction factor from said frequency offset value.

Claim 11 (New): The method of claim 1 wherein said steps (b) through (i) are repeated an integral number of times.

Claim 12 (New): The method of claim 1 further including the step of providing an estimate of data encoded in a continuous-phase modulation signal in response to receiving said corrected frequency offset value.

Claim 13 (New): The method of claim 1 further including the step of transforming said continuous-phase modulation signal into a filtered signal.

Claim 14 (New): The method of claim 9 further including the step of transforming said filtered signal into a sequence of discrete time based samples.

Respectfully submitted,

Celia C. Dunham

Celia C. Dunham, Registration No. 49,041
SPAWARSYSCEN SAN DIEGO
OFFICE OF PATENT COUNSEL, 20012
53510 Silvergate Avenue
San Diego, CA 92152-5765
(619) 553-3001